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STUDIES IN THE GENUS INCISALIA.

BY JOHN H. COOK, ALBANY, N. Y.

V.—INCISALIA POLIOS.

Described in THE CANADIAN ENTOMOLOGIST, Vol. XXXIX, No. 6, p. 204.

When this species was named in June, 1907, the final snarl of a nomenclatorial tangle of thirty years' standing was resolved into its constituent threads. *Incisalia polios* is not a rare butterfly discovered by the fortuitous capture of a few local specimens; it is common in many places near centres of entomological activity. Nor is it an obscure form, to be separated from its congeners only after painstaking study; it is marked in a very characteristic manner, and is easily identified. In fact, it has been mentioned in the literature several times either as a recognizable variety or as a distinct species, but has always masqueraded under an assumed name.

Strecker's misidentification.—In his Catalogue of Butterflies (1878), Herman Strecker listed the *Henrici* of Grote and Robinson as a variety of *irus*, Godart, characterizing it as "smaller" and with the "inferiors tailless." As I have already pointed out,[1] this characterization is erroneous, and does not apply to *Henrici*. It *does*, however, apply to *polios;* and that Strecker had an (at that time) undescribed species before him, which he misidentified as *Henrici*, is proved by specimens of *polios* in his collection labelled *Henrici*. Evidently Strecker had never seen the type of Grote and Robinson's species (which is hardly to be wondered at in view of the strained relations existing between him and Grote), and how he came to make the error is not apparent. But that others have relied upon the accuracy of his determination, and thereby given life to the mistake, cannot be doubted.

W. H. Edwards bred *Henrici*, and expressed his conviction that it was a good species in 1881 (Papilio, I, p. 152). He placed it as such in his catalogue of 1884, although in his earlier catalogue (1877) it had been given as a variety of *irus*. Fernald, C. H., in "The Butterflies of Maine" (1884), followed Edwards in separating *Henrici* specifically from

1. CANADIAN ENTOMOLOGIST, Vol. XXXIX, No. 6 (June, 1907), p. 182.

irus, and appended Edwards' description of the early stages of *Henrici* to the description of a butterfly which *is not Henrici, but polios*. In distinguishing between *polios* and *irus*, it is quite clear that Fernald was misled by Strecker's misidentification into believing that what he called *Henrici* (really *polios*) was the species bred by Mr. Edwards, and the form described by Grote and Robinson.

Following Fernald, both French, G. H.,[2] and Maynard, C. J.,[3] give, under the name *Henrici*, a brief diagnosis of *polios*, contrasting it with *irus*.

One other reference deserves attention in this connection, showing how the true *Henrici* has been lost sight of in the maze of literary error. In the "Butterflies of New Hampshire" (Technical Bull. No. 1, N. H. Coll. Agr. Exp. Sta., Durham, 1901), Fiske, W. F., gives *Henrici* as a synonym of *irus* in the caption of species No. 43, p. 45, and then (under *irus*) discusses *polios*, as may be inferred from the statement that he has taken the species as early as April 19th; or possibly he refers to *polios* and *irus* regarded as one species. In the second paragraph he writes of a very remarkable variety (of *irus*) having tails. This is illustrated, and though the figure is not particularly clear, anyone acquainted with the species will have no difficulty in identifying it as *Henrici* of Grote and Robinson. That Fiske identified *polios* (*i.e.*, the *Henrici* of Strecker, Fernald, *et al.*) as Grote and Robinson's *Henrici*, appears probable from the first sentence under species No. 44 (p. 46), where he says: "*Augustus* is between *Henrici* and *niphon* in point of emergence." Evidently something was taken for *Henrici*, and since it was not the real *Henrici*, it must have been either *irus* or *polios;* and the early emergence points indubitably to the latter.

I find *Henrici* properly identified in the Hill, Bailey and Corning collections in this city (though all specimens are labelled ♀ regardless of their real sex, probably because no stigma is present in the ♂), but there is a specimen in the collection of the late J. A. Lintner (now the property of the State of New York) labeled "*T. irus*, var. *Henrici* (New Hampshire)," which is a ♂ *polios*. I mention this for two reasons: first, because it shows that some, at least, of the elder generation of lepidopterists were led astray by Strecker's blunder; and second, because formerly, while making slow progress through the meagre and much-mixed literature

2. The Butterflies of the Eastern U. S. (1886), p. 273.
3. A Manual of North American Butterflies (1891), p. 144.

toward an understanding of the *irus-Henrici* difficulty, I spoke of this specimen as "an undoubted ♂ *irus*."[4] The reasons for my error at that time are, I think, obvious.

The *Henrici* of Grote and Robinson is figured, as stated, in the Butterflies of New Hampshire (fig., p. 45, under surface of ♀?) and also in Holland's Butterfly Book (plate XXX, fig. 21, upper surface of ♀).

Wright's misidentification.—If one may judge from the rather poorly-marked specimen figured by Wright as *Mossi*, the species represented is *polios*.[5] At any rate, it is *not* the *Mossi* of Hy. Edwards. The type *Mossi* is now in the Museum of Natural History in New York City, and the species for which it stands has never been figured hitherto. In the original description[6] drawn from that type Edwards says of the under side of the secondaries: "*The marginal spots are large, distinct, bright chestnut-brown, six in number*, each surmounted by a small black lunule." And concerning the mesial line (secondaries beneath) it is "narrow, whitish, *with a very large and sharp angle at the median nerve.*" Also concerning the white line crossing the primaries beneath: "From the costa entirely across the wing is a sinuous white band *bent outwardly at the middle*, and edged above by a deep chestnut-brown shade." The wings above are described as "*entirely bright chestnut-brown*, a little clouded, with dusky at the apices and on the extreme margins." It is further stated that the fringes are "wholly white," but this is not strictly the case even in the type.

How far these characters may be regarded as of specific importance remains to be determined, but Wright's illustration is a long way from corresponding in essentials with the type or fitting the description.

Edwards described *Mossi* as a variety of *irus*, adding that "it is quite possible that it is a distinct species; *the uniform deep brown base of secondaries* giving it a most peculiar appearance." Wright says in the text accompanying his figure: "The essential peculiarity of *Mossi* is the *bleached, washed-out appearance of the under side of hind wings*, 'giving it a most peculiar appearance,' as the description truly says." (My italicization throughout.) As a matter of fact, a fresh specimen of *Mossi* is as boldly and cleanly marked as any species of *Incisalia* yet named. I am of the opinion that the species figured by Wright is *polios*.

4. CANADIAN ENTOMOLOGIST, Vol. XXXVII, No. 6 (June, 1905), p. 218.
5. Wright, W. G., Butterflies of the West Coast, plate XXVIII, fig. 331.
6. Edwards, Henry, Papilio I, p. 54 (April, 1881).

Illustrations.—Better than the best description is a good illustration, and it therefore seems well to picture the four species which have been confused. Fig. 1 in the plate represents *irus*, as that species is ordinarily recognized. Godart's original description is too vague and unsatisfactory to enable anyone to identify *irus* with certainty. That author himself was not sure that his type (as it would be called to-day) came from America. We rely on Dr. Boisduval, who says that he saw Godart's specimen, and that it represents the species figured by Abbot (in the Histoire Génerale et Iconographie des Lepidopterès et des Chenilles de l'Amérique Septentrionale, 1833). Abbott's figures are not exceptionally good, but the species intended is undoubtedly the one which has subsequently been known by Godart's name. The specimen here figured was bred from the egg, at Albany, N. Y. It is a ♀. The species is illustrated in colours in Scudder's "Butterflies of the Eastern U. S. and Canada," Holland's "Butterfly Book" and Comstock's "How to Know the Butterflies."

Fig. 2 is the *Henrici* of Grote and Robinson from a homotype bred from the egg at Albany, N. Y. It also is a ♀.

Fig. 3 is a ♀ and fig. 4 a ♂ *polios* (the miscalled *Henrici* of Strecker and others).

Fig. 5 is a ♀ homotype of *Mossi* collected in Colorado. Though imperfect, the specimen corresponds to the type specimen more closely than any other individual of the species which I have seen. The "very large and sharp angle at the median nerve" is about as in the type, and it is hoped that this illustration will illumine Hy. Edwards' description. The large, chestnut-brown spots occupying the interspaces of the secondaries from the margin inward nearly to the "black lunules," effect a photographic plate but little, and therefore appear almost black in the print. Specimen in the collection of the author.

Fig. 6 is a ♂ *Mossi* (from the collection of Jacob Doll), exhibiting the greatest departure from the typical design which I have seen. The varietal differences can be seen at a glance, and need not be discussed here.

All figures represent the under surface × 1.25.

Distribution.—*Polios* is distributed widely over the continent. Along the Atlantic Coast it is found at Lakewood, N. J. (Watson, Sunderland, Cook); Lakehurst, N. J. (Davis, Watson, Brehme, Cook); Jamesburg, N. J. (Watson, one specimen); Medford, Mass. (John Rodgers); Milton,

Mass. (H. H. Newcomb); Durham, N. H.*; Norway, Me.*; Orono, Me. (M. E. Fernald, in coll. Cornell University); and Digby, Nova Scotia (John Russell). From its occurrence at Medford and Milton, the Massachusetts localities (Needham and Walpole), given by Scudder in the Butterflies of the Eastern U. S. and Canada, for the varietal form of *irus* having "the outer margin of the primaries . . . . narrowly hoary," may be safely included as referring to this species.

In the Butterflies of Maine, C. H. Fernald says: "This is a common species in Maine," and Fiske speaks of it as abundant in certain parts of New Hampshire.

Polios was taken in 1907 by Mr. Charles A. Hill, of Chicago, at Pine, Ind., in the sand-dune region along the southern shore of Lake Michigan, where *Synchloe olympia* was recently unearthed. Mr. Hill took fourteen specimens, and reports the species fairly abundant in that locality.

In the west *polios* has been taken at the "head of Pine Creek, Calgary, Alberta (F. H. Wolley Dod)"; forty miles south of Athabasca Landing, Athabasca[7] (McCary); Waghorn, Alberta (P. B. Gregson, in the collections of John Comstock, Evanston, Ill., and Alexander Kwiat, Chicago, Ill.). Dr. Henry Skinner[8] gives as another Canadian locality, Olds, Alberta. Also in Colorado (Morrison, in collection of O. Meske, and David Bruce, in collection of Cornell University); Graham's Park on Rio de los Pinos, Colo.*[9]; South Park, Colo.*; and Chimney Gulch, near Golden, Colo. (Dyar and Caudell).

Without much hesitation I include Puget Sound (Wright), the locality given for the specimen figured in Butterflies of the West Coast *(l.c.)*.

Time of Flight.—Species single-brooded, the butterflies appearing (in New Jersey) with *augustus* about the middle of April, ordinarily becoming abundant before the last of the month, and rarely enduring through May (Watson). In New Hampshire "earlier in its emergence than any of the allied species; . . . . taken on willow blossoms in Durham as early as April 19th" (Fiske).[10] In Maine it "is on the wing during the middle

*Collector unknown.

7. So reads the label, though the only Athabasca Landing which I have found on the map is in Alberta.

8. Entomological News, Vol. XVIII, No. 8 (October, 1907), p. 327.

*Collector unknown.

9. Misprinted "Cal." in the original description of *polios*.

10. Probably careful field work will show that *augustus* is on the wing almost or quite as early.

of May" (Fernald). Fresh specimens from Nova Scotia are labelled from May 15th to 22nd. The few available records from Massachusetts indicate that the species appears there as early as April 25th, and does not fly into June; specimens dated later than May 12th are pretty well worn.

Records from the west show that between the 37th and 56th parallels the imagoes are on the wing during May, twenty degrees of latitude affecting the season of emergence but little, if any. Colorado specimens are labeled as early as April 17th, and faded individuals from Graham's Park and Golden, Colo., were taken May 11th, 12th and 13th. Wright's specimen, taken May 1st at Puget Sound, seems to be somewhat the worse for wear. A ♂ and a ♀ in the U. S. National Museum, collected by Wolley Dod at Calgary, are dated June 29th, and are in very good condition, though not perfectly fresh. However, another ♀ from the same locality was captured May 29th, the individual taken by McCary some 200 miles further north is labeled May 14th, and the specimens received from Waghorn, Alberta, were captured May 3rd and 5th. Mr. Hill secured his butterflies not far from Chicago, on the 19th of May, and all but one bear evidence of having been on the wing for some time.

Haunts and Habits.—In New Jersey the butterflies inhabit the low sandy coastal plain in restricted districts where the larval food-plant occurs, and are to be looked for in sunny spots along the roads and in sheltered glades among the scattered pine growth. They ordinarily fly low, rapidly and for short distances, and delight to feed on the nectar of the early spring flowers, especially the pyxie and (later) the strawberry flowers. They are quite local, ranging over a very restricted field between emergence and death; one may observe them in numbers at one point throughout the day, and yet a few rods away might wait in vain to see one pass.

Mr. Hill took his flitting about in the open over the hot, barren sands, and Dr. Dyar found them in Colorado along a railroad track in the jaws of the gulch, at an elevation of about 7000 feet.

Oviposition.—The females apparently do not oviposit much before the middle of May, but during the latter half of the month eggs may be found without difficulty. These are laid singly at the base of the elongate leaf-buds (rarely on flower pedicels), as shown on fig. 7 on the plate.

The illustration is from a photograph (× 2) of the spray upon which a confined female placed four eggs on May 18th, 1907. Three of these

are visible. In nature they would have been laid on separate buds. As may be seen from the picture, the petioles of the old leaves parallel the stem for a little distance before the blade curves outward. Near the tip of the branch, where the internodes are short, the petioles surround and protect the base of the apical bud, and it is into this protected zone that the female usually thrusts her ovipositor when laying an egg.

The Egg.—Echinoid, flattened on top and bottom, micropyle strongly depressed. Ornamentation a reticulation of extremely high raised lines, broad and losing character by anastomosis at intersections. Interspaces small, deeply sunken, appearing like nearly circular pits. The ornamentation resembles that of the egg of *Chrysophanus thoe* or *Epidemia epixanthe* more than those of more nearly related species which I have seen (except that of *Incisalia Mossi*, from which it is practically indistinguishable), and may be identified at once by the absence of bosses and the "pin-hole" interspaces. Fig. 8 micropylar aspect, fig. 9 equatorial aspect. Both × 35.

(To be continued.)

A NEW SPECIES OF SYNTOMASPIS (CHALCIDOIDEA).

BY CYRUS R. CROSBY, CORNELL UNIVERSITY, ITHACA, N. Y.

Syntomaspis thalassinus, n. sp. (Figs. 2, 3 and 4).—Female.—Length, excluding the ovipositor, 2.6 mm.; abdomen, 1.2 mm.; ovipositor, 1 mm.

Head transverse, abruptly convergent behind the eyes, seen from in

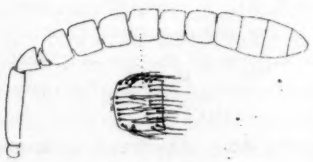


FIG. 2.—Antenna of male.

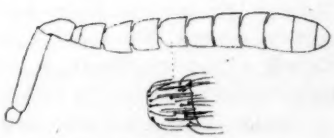


FIG. 3.—Antenna of female.

FIG. 4.—Stigmal region of wing.

front rounded triangular, greenish-bronze, sculpture of head a fine and delicate ridging, which gives a very fine reticulation; face with a few larger

punctures, margin of clypeus smooth, convex. Mandibles tridentate, lower tooth rounded.

Thoracic dorsum finely reticulate, bluish-green, metallic, parapsidal furrows impressed, the median portion of the mesonotum extending further back than the lateral piece, and broadly rounded behind, scutellum rounded in front, widely separating the axillæ, margined and evenly rounded behind, the transverse stria distinct; axillæ prominent, acute mesally and rounded in front. Thoracic pleura delicately sculptured except metepisternum and the sclerites behind it. Propodium short, transverse, nearly smooth, very finely rugulose longitudinally. Spiracles oblique, elliptical.

Scape and pedicel of antennæ metallic, scape finely shingled, funicle dark brown, clothed with short but stout hairs, scape rather short, slender, pedicel obconic, about as long as first joint of funicle, succeeding joints subequal, gradually wider, club obtusely rounded, white longitudinal ridges on funicle joints, with their bases in one row, and all extend to tip of segment.

Legs metallic-green; knees, tip of tibiæ and tarsi dull, whitish-yellow, last tarsal joint somewhat dusky; posterior coxæ irregularly reticulate. Wings hyaline, stigmal vein shorter than diameter of club, the four sensoria arranged in a curved line, concave behind.

Abdomen seen from above conic-oval, bluish-green, metallic, second dorsal segment smooth, posterior segments with a hexagonal pavement-like sculpture, posterior margin biconvex, very deeply incised at middle, segment 5 longer than 3 and 4 together, posterior margin of 3 deeply incised, 4 and 5 less deeply, 6 truncate behind. Cerci bearing several long, stiff hairs. Ovipositor dark brown, tip lighter.

Male.—Length, 1.2 mm.; abdomen, .8 mm. Resembles the female very closely in colour. The antennæ are somewhat stouter. Posterior margin of abdominal segments not so deeply incised as in female.

Described from numerous specimens reared from timothy grass and orchard grass. Parasitic on an Isosoma and another Chalcid as yet undetermined.

Ithaca, Amsterdam, Lake Keuka, Oneonta, Kingston, Cranberry Creek, Remsen, Elmira, Lowville, Bluff Point, Cortland, and Victor, N. Y. Types in Cornell University collection.

SOME NEW NEMATID SAWFLIES FROM COLORADO.

BY S. A. ROHWER, BOULDER, COLORADO.

The following descriptions are based principally on material collected by myself during the past summer. One new species is described from the collection of the Colorado Agricultural College; the rest are in my own collection.

Many thanks are due to Professor T. D. A. Cockerell for going over all the descriptions. The work is a contribution from the laboratory of Systematic Zoology in the University of Colorado. I am greatly indebted to Professor C. P. Gillette for the loan of the collections belonging to the Colorado Agricultural College.

The following descriptions of *Pontania* galls seen at Florissant, Colorado, may be of some use. On *Salix brachycarpa*, Nutt.: (1) Monothalamous; springing from lower side of leaf; arranged along the midrib; globular; colour pale pinkish; measurements before maturity 8 mm. (2) Monothalamous; bisecting leaf; attached near petiole in clusters of two to four; bright rose colour above, pinkish below; measurements before maturity, 10–12 mm.; similar to *P. resinicola*, Marl. Another *Potania* gall on *Salix* sp., is much like *P. Bruneri*, Marl, but did not bisect the leaf, and was attached along the midrib; only one monothalamous gall on each leaf. The *Salix* belongs to *Longifoliæ* as defined by Dr. Rydberg in his Flora of Colorado (Bul. 100 Colo. Agricultural College) and probably is *S. exigua*.

Pontania leucostoma, n. sp.—♂. Length, 5 mm. Moderately robust; head nearly as wide as thorax; clypeus shallowly, circularly emarginate, lobes broad, rounded; ocellar basin distinct, walls rounded; antennal fovea broad, shallow, elongate; antennæ extending beyond thorax, third and fourth joints equal, fifth shorter; joints somewhat nodose at tips; vertex back of ocelli with a few well-defined punctures; mesothorax above with a few small, more indistinct punctures. Venation of primaries normal; secondaries with the lower discal cell longer and wider than upper, claws deeply notched, inner ray shorter and somewhat slender.

Colour in general shining black; face below antennæ, except two black spots below antennæ, clypeus, labrum, mandibles, except tips which are piceous, posterior angles of pronotum, tegulæ, base of costa, apex of anterior coxæ whitish; posterior orbits, upper orbits, inner orbits narrowly, apex of four hind coxæ, trochanters (coxæ and trochanters are inclined to pallid), meso-femora except a narrow line above, meso-tibiæ, meta-femora

except a broad line above and below, meta-tibiæ except at apex, venter near apex, and edges of the hypopygium ferrugino-testaceous ; meso-tarsi and palpi brown ; hind tarsi black. Wings dusky hyaline ; costa, except at base which is white, and stigma yellow-brown ; rest of the nervures brown.

Habitat.—Boulder, Colo., May 22, 1907 (S. A. Rohwer), on foliage of *Populus angustifolia.*

In Marlatt's Revision of the Nematinæ (Tech. Ser. No. 3, U. S. Dept. Ag.) this species runs to *P. pisum*, Walsh, but it is not that, and may be separated from it by the short fifth antennal joint, different shape of the clypeus, not having the third cubital quadrate, the black antennæ, black line on femora above, yellowish-brown stigma, etc. It also seems to be related to *P. glinka*, Kincaid, but may be separated from that species by the unequal tarsal claws, the lower margin of the stigma being rounded, etc.

Pontania brachycarpæ, n. sp.—♀. Length, 4½ mm. Head almost as wide as thorax ; seen from above broadly rectangular ; clypeus angularly emarginate, lobes triangular, ocellar basin shallow, the walls broad and rounded ; ocellar basin with small, dense punctures ; antennal fovea distinct ; antennæ stout, extending about to basal plates, fourth and fifth joints equal, third longer ; frontal crest slightly emarginate. Third cubital cell sub-quadrate ; upper discal cell of hind wings slightly exceeding the lower ; claws deeply notched, the inner ray shorter and somewhat stouter ; sheath with long brownish hairs. Colour in general black; clypeus, labrum, mandibles, except tips which are piceous, cheeks, face, somewhat between the antennæ, upper and posterior orbits broadly, inner orbits narrowly, extreme angle of pronotum, tegulæ, coxæ except base, trochanters, femora, tibiæ and tarsi, extreme tip of last dorsal segment, last ventral segment slightly, pale reddish yellow, coxæ and trochanters inclined to pallid; palpi brown ; tarsi (especially the posterior ones) and apex of posterior tibiæ infuscate. Wings hyaline ; nervures dark brown, costa white at base.

Habitat.—Florissant, Colo., June 16, 1907 (S. A. Rohwer) on foliage of *Salix brachycarpa.*

This species is closely related to *P. pisum*, Walsh, but may be separated by the following characters: Head not so wide as thorax, upper discal cell slightly exceeding the lower, claws with inner ray shorter and stouter ; pronotum mostly black. It is also somewhat related to *P. consors*, Marl. (CAN. ENT., Dec., 1898), and may be known from it by the subquadrate third cubital, black sheath and venter and the apical half of the abdomen being black. It also has much general resemblance to *P. leucostoma*,

n. sp., but is smaller, the wings less dusky, the nervures weaker; and upper discal cell of hind wings extends beyond the lower, whereas the lower beyond the upper in *P. leucostoma*.

Pontania megacephala, n. sp.—♂. Length, 4 mm. Head wider than thorax; transversely oval; inner orbits parallel; clypeus rather deeply and angularly emarginate, lobes broad, rounded; vertex flat, slightly raised back of ocellar basin shallow, walls rounded; antennal fovea small, round, but distinctly defined; antennæ a little shorter than body, third, fourth and fifth joints equal; last seven joints with dense, short black hairs. Venation normal, except that the third cubital is rather small, claws minutely but evenly cleft.

Colour in general, black; clypeus, labrum, mandibles, except tips which are piceous, cheeks, extreme posterior angles of pronotum, tegulæ, apex of coxæ, white; small indistinct spot on upper orbits, posterior orbits on one side very narrowly, trochanters, femora, except line above on meso- and meta-, and line below on pro-femora (the line on the meta-femora is broad), tibiæ, apex of venter and hypopygium pale reddish-yellow; tarsi (the anterior tarsi are much the same as the tibiæ) brownish; palpi brown. Wings hyaline; nervures brown, costa white at base, stigma pallid at base.

Habitat.—Florissant, Colo., June 16, 1907 (S. A. Rohwer), on foliage of *Salix brachycarpa*.

This species is related to *P. agilis*, Cr., but may be separated by the flatter vertex, broader lobes of the clypeus, claws somewhat deeper cleft and much darker colour. *P. agilis* in general is yellow-ferruginous.

Pontania maura, n. sp.—♀. Length, 4 mm. Robust. Head much narrower than thorax, small and almost round when seen from the front; clypeus nearly truncate; ocellar basin with wall rounded: antennal fovea small, round, distinctly defined; antennæ as long as head and thorax, fourth and fifth joints equal, third shorter and about equal in length with sixth; vertex rounded; head finely and densely punctured; mesothorax above finely, but not as densely as head, punctured. Venation normal, claws deeply cleft, rays subequal and somewhat diverging.

Colour black, except apex of femora, tibiæ and tarsi, which are pale testaceous; tarsi, especially the hind ones, infuscate, hind tibiæ somewhat infuscate; ovipositor luteous. Wings very hyaline; nervures brown, costa, stigma and all the nervures at base of wing pallid, almost hyaline.

Habitat.—Florissant, Colo., June 1, 1907 (S. A. Rohwer), on foliage of *Salix brachycarpa*.

This species is related to *P. atra*, Marl., but may be separated from it by the light nervures of the wings, dark trochanters, claws deeply notched, etc. It is also more robust. It is also related to *P. unga*, Kincaid, but may be separated by the nearly truncate clypeus, the tarsal claws being subequal and diverging, smaller size, light stigma and costa, and veins being paler, etc.

Pontania melanosoma, n. sp.— ♀. Length, 3½ mm. Robust; clypeus circularly emarginate, lobes broadly rounded, antennal fovea distinct, circular; ocellar basin indistinctly defined; ocellar regions raised; from lower ocellus running to top of each eye is a broad, shallow furrow; antennæ extending to base of abdomen, third and fifth joints equal, fourth a little longer, head and mesosternum finely and rather densely punctured. Third cubital cell subquadrate, slightly wider at apex than at base; upper discal cell of hind wings slightly exceeding lower. Claws deeply notched, rays subequal. Sheath broad, slightly emarginate beneath, acuminate at tip; cerci robust, tapering.

Colour mostly black; clypeus, labrum, mandibles, spot between antennæ, antennæ beneath, except scape, dark brown; a triangular spot on upper orbit fulvous; posterior angles of pronotum, tegulæ, legs, except bases of coxæ and tip of posterior tibiæ and their tarsi, which are infuscate, reddish-yellow. Wings dusky hyaline, nervures brown, base of stigma and all the nervures as they near the base of wing, white. Clypeus with a few long white hairs.

Habitat.—Fort Collins, Colo., May 13, 1899. Type in the collection of Colorado Agricultural College.

In Marlatt's Revision of the Nematinæ of N. Am., this species runs to *P. nigrita*, Marl., but is easily known from that species by the circular antennal fovea and the black posterior orbits.

Pteronus hypomelas, n. sp.— ♀. Length, 5 mm. Clypeus broadly, shallowly, circularly emarginate, lobes small; antennal fovea not distinctly defined; ocellar basin with walls rounded; between the ocellar basin and the eye is a rather large impression; frontal crest broken in the middle; antennæ reaching to about the third abdominal segment, third, fourth and fifth joints subequal; head with rather sparse, small punctures; pleura sericeous, claws deeply notched, inner ray somewhat shorter than outer. Third cubital cell twice or nearly twice as wide at apex as at base, two and a half or three times as long as width at base; outer veins of discal cell of hind wings meeting or upper cell slightly extending beyond lower, lower discal one and a half times as wide as upper; stigma regularly tapering from near base to apex.

Colour black ; lobes of clypeus, labrum, mandibles, tegulæ, legs from middle of femora, last apical segment of abdomen, reddish-ferruginous ; trochanters pallid ; palpi brown ; upper orbits dark reddish. Wings hyaline ; nervures light brown, costa at base and the entire stigma pallid.

Habitat.—Florissant, Colo., June 1, 1907 (S. A. Rohwer), on foliage of *Salix brachycarpa.*

In Marlatt's Revision of the Nematinæ of N. Am., this species runs out because of the black venter, but it seems to be related to *P. atriceps*, Marl., and may be separated from it by the black venter, smaller size, the fovea not deep, etc.

Pteronus notatus, n. sp.— ♀. Length, 5½ mm. Clypeus angularly emarginate, lobes round, antennal fovea deep, narrow, elongate ; ocellar basin with walls round ; frontal crest broken in the middle ; antennæ slender, reaching about to third abdominal segment, joints three, four and five subequal, the third a little curved ; sheath broad, obtusely pointed, without any hairs at apex. Claws deeply cleft, inner ray a little shorter than outer. The third cubital cell one and a half times as wide at apex as at base, a little more than twice as long as wide at base ; upper discal cell in hind wings extending considerably beyond lower ; stigma straight on lower margin until apical third, where it slants abruptly upward.

Colour black, clypeus, labrum, base of mandibles (the tips are piceous), coxæ, except at base of posterior ones, trochanters, posterior angles of pronotum and tegulæ whitish ; upper posterior and superior orbits broadly, legs from trochanters, except a thin black line above and below on posterior femora, apical segment of abdomen and sheath somewhat, ferruginous ; palpi brown. Wings dusky hyaline ; nervures brown, costa and stigma pallid.

Habitat.—Florissant, Colo., June 23, 1907 (S. A. Rohwer), on foliage of *Salix brachycarpa.*

In Marlatt's Revision of the Nematinæ of N. Am., this species runs out on account of the black venter, but it seems to be near *P. Coloradensis*, Marl, from which it may be separated by the black venter, antennal fovea *not* being triangular, etc. It is, however, closely related to *P. hypomelas*, n. sp., but may easily be separated by the following comparison. Other characters also separate these two species :

P. hypomelas.

1. Clypeus broadly, shallowly emarginate, lobes small.
2. Eyes almost round on upper margin.

3. Stigma tapering from near base to apex.

4. Upper discal cell of hind wings but slightly, if any, exceeding lower.

5. Posterior angles of pronotum black.

P. notatus.

1. Clypeus angularly emarginate, lobes round.

2. Eyes oval on upper margin.

3. Stigma straight until apical third, when it slants abruptly upwards.

4. Upper discal cell of hind wings extending considerably beyond lower.

5. Posterior angles of pronotum and tegulæ whitish.

MOSQUITO NOTES.—No. 6.

BY C. S. LUDLOW, M. SC.

Laboratory of the Office of the Surgeon-General, U. S. Army, Washington, D. C.

(Continued from page 34.)

In the same sub-family as *Cellia flava* comes an insect closely related to *Chagasia*, Cruz., having the outstanding whorls of scales on the lower joints of the antennæ, but lacking the outstanding scales on the thorax, and differing also in that part of the abdomen is scaled.

Chagasia (?) *lineata*, n. sp.—Head very dark, practically black, as is most of the insect, covered with dark brown and white-forked scales, the latter on the vertex and cephalad part of the occiput, very long slender white scales projecting forward between the eyes, dark bristles near the eyes; antennæ very dark, verticels and pubescence white, basal joint brown, with white upright flat scales, 1st and 2nd joints with white scales, those on the second joint longer, more curved, largely fusiform and outstanding, those on the first joint narrow, flat and, more closely appressed; palpi heavily covered with dark brown scales, rather erect near the base, the apex white, and two narrow white bands dividing the remainder into three nearly equal parts; proboscis heavily covered with dark brown scales, tip light; eyes dark, clypeus dark.

Thorax: prothoracic lobes with broad fusiform white scales and dark bristles; mesonotum covered sparsely with broad fusiform white scales arranged in lines, near the nape a few slender curved white scales, most of which project forward, a distinct line of the broad fusiform scales cephalad of and over the wing joint, not especially outstanding, but the scales broader than most of those on the mesonotum, a few scales near

the middle of the mesonotum are either discoloured slightly or normally yellowish, two long oblong, bare, black, laterad spaces about one-third the length of the mesonotum extend cephalad from near the scutellum; scutellum black, partly denuded, but with a heavy bunch of flat, rather fusiform, white scales on the lateral lobes, bristles black; pleura black, with gray lines; metonotum very dark.

Abdomen black, densely covered with brown hairs, and the eighth segment and genitalia rather closely covered with long flat more or less spatulate brown scales.

Legs: coxæ and trochanters testaceous with dark hairs and white scales; all the femora covered with dark brown scales, the hind and mid legs with a white subapical spot on the cephalic aspect, and all of them with apex very narrowly white-banded; tibiæ all brown, with small apical spot or band; first tarsal joints all brown, in the hind leg with small apical white spot extending slightly on the second joint, in the fore and mid with narrow apical white bands; second tarsal brown, with broad white apical bands, broadened on the hind leg, in which all the remaining joints are pure white, and in the other legs the third and fourth are apically white-banded, the fore leg the more distinctly, the fifth brown; ungues large, simple and equal.

Wing clear, covered heavily with dark brown scales resembling those found in Myzorhynchus; costa with four small white spots, all apparently confined to the costa, and one at the apex; a white fringe spot at the junction of the upper fork of second long vein; first submarginal cell large, a fourth longer and quite as wide as the second posterior, its stem half its length; second posterior cell shorter than first submarginal, its stem nearly as long as the cell; upper cross-veins equal and meet, posterior cross-vein equal to and a little more than its length distant from the mid. Halteres with light stem and dark knob.

Length, 4 mm. Habitat: Camp Gregg, Pangasinan, Philippine Islands. Taken in August.

Described from one very perfect specimen sent by Capt. Schreiner, Asst. Surgeon U. S. Army. It is noticeably different even to the naked eye from most of the *Anophelinæ*, but I am not sure that it belongs to *Chagasia*, as Mr. Theobald makes the outstanding scales of the thorax of generic value, and states specifically that the abdomen is nude.

A new species in one of Mr. Theobald's new genera has also lately come from the Philippine Islands:

Pseudoskusea nigrotarsis, n. sp.—Female. Head very dark, covered with very dark brown flat scales, a pale (grayish) lateral stripe, no fork scales; antennæ brown, verticels and pubescence brown, basal joint brown, with a few small brown flat scales; palpi dark with dark brown scales; proboscis the same; eyes brown; clypeus brown.

Thorax dark; prothoracic lobes dark brown, with dark brown bristles; mesonotum covered with dark brown slender curved scales having golden reflections, dark brown bristles, apparently two rows besides those over the wing-joint; scutellum dark with curved scales, as on the mesonotum; pleura brown with patches of long flat spatulate white scales and dark brown bristles; metanotum very dark brown and shiny.

Abdomen dark, covered with very dark, almost black, scales, and white *mid-segment* bands not prolonged into lateral spots, light apical bristles. The light bands are grayish, and not so well developed on the more caudad segments. Venter dark scaled.

Legs: coxæ and trochanters light, with light scales and dark bristles; femora with dark brown scales dorsally, grayish ventrally, and a small gray apical spot, remainder of the legs entirely dark brown; ungues on fore and mid legs equal, and each with a small tooth, hind ungues simple.

Wings clear, with brown scales, the median small, truncate, the lateral lanceolate, and the ventral long, slender and slightly curved; cells short, bases about on a line, first submarginal a little longer and narrower than the second posterior, the stems nearly the same length, and approximately as long as the cells; supernumerary and mid cross-veins meet, posterior cross-vein about one-half the mid and three times its own length distant; halteres with light stem, knob dusky.

Length, 4.5 mm. Habitat: Infanta, Tayabas, Philippine Islands. Taken October, 1907.

The abdominal markings at first suggested *Skusea funerea*, Theob., but the fore and mid ungues bear the small tooth noted for *Pseudoskusea*. Described from one perfect specimen sent by Dr. Warriner in a collection mostly composed of *Stegomyia calopus* and *Culex fatigans*, varied by a couple of *Myzomyia Thorntonii* and two or three of *M. Ludlowii*.

In the description of *Cellia flava* in the January number (page 32, third line from bottom) the phrase "basal joint testaceous" should have appeared as part of the description of the antennæ, not of the palpi. The mosquito was taken at Camp Wilhelm, Tayabas (not "Tayubar"). A few other errors are obvious.

SEXUAL FORMS OF *TOXOPTERA GRAMINUM*, ROND.

BY F. L. WASHBURN, ST. ANTHONY PARK, MINN.

We have not found sexual forms of the so-called "green bug" in the field in Minnesota, nor have we been able to rear them outside in cages, but have had no trouble in getting this form in the insectary. Mr. R. A. Vickery, who has charge of our insectary work, reports them as appearing indoors on Oct. 15, shortly beginning egg-laying.

The winged males are smaller than the viviparous females, and have a larger number of sensoria on their antennæ. The oviparous females can readily be distinguished from the apterous viviparous females by their swollen hind tibiæ, by the eggs, which can be seen through the walls of the abdomen, and by the presence of circular sensoria on the antennæ.

In ovipositing, most of the eggs were placed on the upper side of dead leaves of grain. Apparently one female lays quite a number of eggs. Mr. Vickery reports finding ten nearly mature eggs in one female. The viviparous females continue producing young during and after the appearance of the sexual forms, and young were freely produced in the cold room of the insectary, although the temperature has been down to ten degrees above zero. The following is a brief description of the sexual forms of this species:

Oviparous Female.—(Fig. 5.) Length, 2-2.25 mm.; colour, yellowish-green, median line of abdomen darker green; head and prothorax somewhat paler than the rest of the body. Eyes black; antennæ black, except the two basal joints, and the basal half of the third, which are of the same colour as the head. Legs yellowish, tibiæ brownish toward the apex, tarsi black; cornicles greenish, their apex black; cauda greenish. Antennæ slender, hardly one-half the length of the body, no circular sensoria. Cornicles slightly tapering, not reaching to the end of the body. Cauda slender, somewhat constricted above the middle, about two-thirds the length of the cornicles. Tibia of hind leg swollen and thickly covered with sensoria-like swellings. Lateral tubercles small and single.

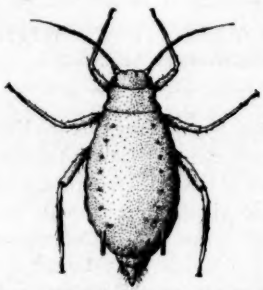


FIG. 5.—Oviparous female. (Original.)

Winged Male.—(Fig. 6.) Expanse of wings about 4.5 mm.; length of body about 1.3 mm. General coloration of the abdomen yellowish-green; head brownish-yellow; eyes black; antennæ black, except the two basal joints and the proximal half of the third, which are yellowish-green. Legs yellow, the female more or less dusky, the posterior pair darkest; apex of the tibiæ and tarsi black; cornicles yellowish, with black apex; cauda yellowish. Wings: costa and subcosta yellow; stigma paler, the inner edge of the stigma and the veins black. Antennæ long and slender, reaching to or a little beyond the end of the body; third joint with about twenty circular sensoria; fourth with about eighteen; fifth with about nine. Cauda slender, somewhat constricted about the middle, as long as the cornicles. Lateral tubercles small and single.

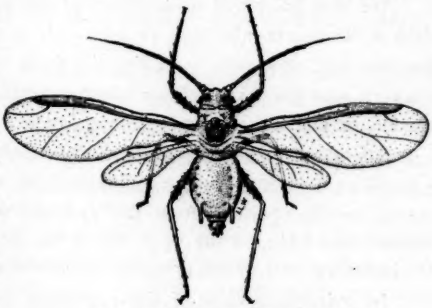


FIG. 6.—Winged male. (Original.)

Egg.—The egg is oval in shape, about .65 mm. long and .3 mm. broad. It is blue-green in colour when first laid, but changes to shiny black after a few days.

NOTES ON THE LEPIDOPTERA OF KASLO, B. C., WITH DESCRIPTIONS OF SEVEN NEW SPECIES.

BY GEO. W. TAYLOR, WELLINGTON, B. C.

Mr. J. W. Cockle, of Kaslo, so well known as an energetic student of the Kootenay Lepidoptera, has lately paid me a short visit at Wellington. He very kindly brought with him several boxes of Kaslo Geometridæ, and during his stay here we very carefully studied all the species, with the result that over 20 names will have been added to our British Columbian list.

About 12 of Mr. Cockle's captures appear to belong to undescribed species. Seven of these I shall describe in the present paper, but the others being uniques in Mr. Cockle's cabinet I shall reserve until further material can be obtained.

February, 1908

In addition to the above, Mr. Cockle brought specimens of 12 species which are new to the British Columbian list, as follows:

Rachela Bruceata, Hulst.—Differs from our coast form, *R occidentalis*, Hulst.

Rachela pulchraria, Taylor.—A new species described in a paper read by me last May before the Royal Society of Canada, and now going through the press.

Eupithecia scelestata, Taylor.— } Also described in the above-men-
Eupithecia minorata, Taylor.— } tioned paper.

Eupithecia adornata, Taylor.—Described from Calgary. Three specimens taken at Kaslo by Mr. Cockle.

Eucymatoge vitalbata, D. & S.—One specimen, 6, viii, '07; previously only known from Alberta.

Cinglis ancellata, Hulst.—Common at Kaslo.

Diastictis bitactata, Walker.—Recorded by Dr. Dyar in Lep. Koot., but accidentally omitted from our B. C. list.

Diastictis denticulodes, Hulst.—Two male specimens, June 26 and August 20. This species was taken by Mr. R. V. Harvey in the Similkameen country last year, but it has not yet been recorded.

Selidosema separataria, Grote (?)—This is a species congeneric with our *S. excelsaria* and *S. albescens*. It seems to answer fairly well to Grote's description of *S. separataria* (from Arizona), and if not that species it must be undescribed. Mr. Cockle has three specimens, two males taken on August 15, 1905, and one female August 14, 1907.

Sabulodes catenulata, Grote.—Recorded by Dyar in Lep. Koot., but omitted in our B. C. check list because the specimen sent to me with this name by Mr. Cockle was *Synaxis pallulata*. I have since seen the true *S. catenulata* from Kaslo.

Sabulodes auranticaria, Pack.—One female specimen. Kaslo, June 20, 1901.

The following are new to the Kaslo list, though not to British Columbia:

Eupithecia castigata, Hubner; *Plemyria tristata*, Linn.; *Hydriomena speciosata*, Pack.; *Hydriomena costiguttata*, Hulst; *Xanthorhoë pontiaria*, Taylor; *Coniodes plumogeraria*, Hulst; *Synaxis pallulata*, Hulst; *Metanema inatomaria*, Gueneé; *Azelina ancetaria*, Hubner (typical).

DESCRIPTIONS OF NEW SPECIES.

1. *Eupithecia placidata*, n. sp.—Expanse, 24–26 mm.

Palpi large and bushy, porrect, dark gray, much darker than the thorax or abdomen. Front and thorax light gray, thorax becoming lighter, almost white posteriorly. Abdomen above a little darker than the thorax, dorsal tufts not conspicuous, except on second and third segments, where they appear to be black.

Wings rather long and acutely pointed. Fore wings even light gray, with a slight brownish tinge in the median space, particularly near the inner margin. The wings are crossed by numerous very fine broken black lines; about four of these are between the intradiscal line and the base of the wing. The intradiscal line is fairly well defined (in the best of the type specimens) from the median vein to the inner margin, where it is much nearer the base of the wing than it is at its point of origin on the costa. The median space includes two faint black cross lines more distinct near the inner margin, and an indistinct discal spot. Extradiscally there appear to be three lines, which are nearer to each other at the inner margin than they are at the costa; the outermost of the three is broken into dots.

The submarginal space is nearly free from markings, the submarginal white line is very faintly indicated; the marginal line on all the wings is dark, hardly interrupted at the veins.

Hind wings the colour of the fore wings, a little paler costally and darker at the extreme base; acute, slightly indented at vein 5. A minute discal dot. About seven very faint parallel cross lines, four being extradiscal and traceable right across the wings.

Fringe on all wings pale, with dusky median line almost continuous. Beneath pale leaden gray, with all markings very faintly and diffusely reproduced. The discal spots and the costal halves of the extradiscal lines on the fore wings being most clearly seen.

Abdomen paler than above; pectus white.

This species seems quite distinct from any other known to me. I have seen three specimens, all females, and all taken at Kaslo by Mr. Cockle on July 7 and 11, 1907.

One type is in my own cabinet, and the other two in that of Mr. Cockle.

2. *Eupithecia agnesata*, n. sp.—Expanse, 18 mm.

Palpi short and inconspicuous; front almost black; head, thorax and abdomen above gray; a darker bar across thorax in front of the middle; second segment of the abdomen darker gray; dorsal tufts black.

Wings, ground colour gray, with a good many black scales.

Fore wings acutely pointed, both costal and outer margins being rather straighter than usual. Colour gray, with brown shade in extradiscal space and many black scales. The cross lines are black, but those in the basal area are not well defined; extrabasally there is a distinct black spot on the costa; median space blackish, the lines confused; the ground colour shows more clearly around the distinct discal spot and at the base of veins 2, 3 and 4, the veins themselves being black. The median space is also distinctly lighter towards the inner margin; pale bands bound the median space on both sides, and in each case these bands are cut by thin black lines parallel to the intradiscal and extradiscal lines respectively.

Submarginal space dark, traversed by a white zigzag submarginal line; a conspicuous square black blotch on the costa, between the submarginal line and the extradiscal pale space; a black marginal line; fringe gray, cut with darker shades.

Hind wings: dark scales along the costa and between the inner margin and vein 2; the rest of the wing is almost clear of markings, except the reflections of the dark lines on the under side of the wing; marginal line and fringe as on fore wings. Beneath gray, with very distinct black markings, especially on the hind wings. These markings consist, on the fore wing, of a straight intradiscal line, a prominent discal spot, a curved extradiscal line, heavy and distinct on the costal half, and a submarginal black band, broad on the costa, but becoming narrower towards the tornus; this line is bounded by a distinct white zigzag line; marginal line well marked; inner margin quite clear of markings.

Hind wings very distinctly marked with black on a gray ground. There are two intradiscal lines, one median line passing through the distinct discal spot, a broad extradiscal line, then a pale space, then a strong waved black submarginal and a black marginal line, accompanied inwardly (as is the similar line on the fore wing) by a dark marginal shade.

This is a very distinct species, not like any other that we have in British Columbia, but slightly resembling the *Eupithecia edna* of Hulst.

The single type is a female taken at Kaslo on July 12, 1907, by Mr. Cockle, and it is in his cabinet.

3. *Eupithecia terminata*, n. sp.—This species and that next to be described both belong to a group of which the commonest form in British Columbia is one to which I have always applied the name *perfusca*, Hulst. The species in this group are very nearly allied, and with more abundant material I have already been able to distinguish four B. C. forms.

Dr. Hulst's types of *perfusca* came from Euston, Washington, and from Utah, the last named type being in the United States National Museum.

They may or may not be conspecific, and as they are not now in the best of condition it is not an easy matter to ascertain with certainty which form has the best title to the original name. I suggest, therefore, that the very common western form, to which I have limited it in my own cabinet, shall be allowed to retain the name *perfusca*, Hulst. This form has been identified by Dr. Dyar as conspecific with specimens so named for him by Dr. Hulst, and probably with the type from Utah, and it answers as well as any of its allies to Hulst's original description. If the other types in the Hulst collection prove to differ they may be given a new name. The true *E. perfusca* as thus restricted (type from Utah and B. C. specimens) can be distinguished from the other species of the group by a *brown shade*, which in fresh specimens is distinctly visible at the junction of veins 3 and 4 of the fore wing. This is easily seen in all of the 30 specimens before me at the present moment.

Eupithecia terminata may be described as follows:

Expanse, 25 mm. Very closely allied to *E. perfusca*, but it is a little larger and considerably darker in colour. The palpi (in *terminata*) are distinctly longer, the brown shade at the junction of veins 3 and 4 is absent.

The most easily-noted difference is, however, in the hind wings. In *E. terminata* these are rather heavily dusted with black scales, especially towards the outer margin, where they give the appearance of a wide submarginal dark band. This band is not intersected by the usual white submarginal line, which can be traced in *perfusca*, but there is a very slight indication of a white dot submarginally in the neighbourhood of vein 1. The margins of the hind wings are not so noticeably depressed at vein 5 as in *perfusca*.

This species has not yet been noticed on Vancouver Island, and is not a common insect at Kaslo.

I have marked as types three very perfect specimens, all taken by Mr. Cockle at Kaslo. Two of these are in my cabinet and one in that of the captor.

The dates are June 7, 1906; June 1, 1906, and May 11, 1906.

4. *Eupithecia Slocanata*, n. sp.—This species is also a near ally of *perfusca*, but may be distinguished by the narrower and longer fore wings, the very straight costal margins, the soft gray tone of the colouring of the whole insect, there being no trace of the brown tints of *perfusca*, and the general indefiniteness of all the lines. The hind wings above are paler and clearer of markings, aud the white spot at the tornus on the fore wings is much more distinct than is the case in *perfusca*.

The types are two specimens from Kaslo, a male dated 30th May, 1907, and a female dated 27th July, 1907, in my own collection, and three other specimens (10th July to 1st August), also from Kaslo, in the cabinet of Mr. Cockle.

All the forms above mentioned, namely, *E. perfusca*, *E. terminata* and *E. Slocanata*, together with *E. scelestata*, were included by Dr. Dyar in his "Lepidoptera of Kootenai," under the name *E. satyrata*, Hubner (a European species). This was no doubt entirely due to the insufficiency of the material which he had before him at that time. He suggested, however, that the *perfusca* of Hulst might be the same thing, but he had not enough specimens in hand to enable him to discriminate the forms I have here characterized.

5. *Xanthorhoë planata*, n. sp.—I propose this name for the insect that is now passing in Eastern collections as *X. fluctuata*. I have it from Ottawa, New Jersey, Pennsylvania, etc., and it now appears among Mr. Cockle's Kaslo captures.

The differences between *planata* and *fluctuata* are not great, but appear to be constant. The ground colour of *fluctuata* has very commonly a slight greenish or yellowish tint, and the black markings are intense; in *planata* the colours are brown and brownish- or grayish-white. The extradiscal line in *fluctuata* is gently rounded out from the costa, and curves well inward between veins 4 and 6; in *planata* this curve becomes almost triangular, and the angle above vein 6 is acute. The basal line furnishes the best character. In *fluctuata* it is well rounded, having three outward and four inward scallops, and the space within it forms a conspicuous dark blotch. In *planata* the line runs out almost straight to cell,

and then at right angles directly to the inner margin, where it is much nearer to the base of the wing than it was at its point of origin on the costa, and the basal blotch is not nearly so conspicuous as in *fluctuata*. Finally, the outer margin in *fluctuata* is less rounded than in *planata*.

These differences may appear slight, but they seem to be constant; and, in view of the fact that the two insects inhabit different continents, I think that the new name is justified. I have compared 19 European with numerous American specimens, and I have not found any intermediate forms.

6. *Aplodes unilinearia*, n. sp.—Expanse, 32–33 mm.

This species may be best described by comparing it with the known species of the genus. *A. brunnearia* is brown, so cannot be confused with any other species. *A. rubripontaria*, Pack., *Darwiniata*, Dyar, and two manuscript species of my own *intermediata* from Nevada, and *Californica* from California, all have the abdomen in the male with white dorsal spots circled with red, and have the extradiscal lines on the hind wings extending from margin to margin.

In *A. mimosaria* the lines are also continuous, but the abdomen has not any red spots. In *A. Hudsonaria* and in the present species, the abdomen agrees with *mimosaria*, but the outer line on the hind wings does not reach the inner margin of the wing. The difference between *Hudsonaria* and *unilinearia* is that in the males of the latter the inner lines on all the wings are obsolete, and the outer line on the hind wing in both sexes is further from the base of the wing and takes a different course, for while the same line in *Hudsonaria* would, if produced, reach the base of the wing, in *unilinearia* it would touch the middle point of the inner margin. *A. unilinearia* is a trifle larger than *Hudsonaria*, but not quite so large as *Darwiniata*. Mr. Cockle brought with him four specimens taken at Kaslo and dated 6th August, 1907 (a female), and 7, 14, 21 July, 1907 (3 males). The first three he retains in his own cabinet, and the last named is in my collection.

Two female moths from Victoria which I recorded (in CAN. ENT., XXXVIII., 206) as probably *A. Hudsonaria*, are *A. unilinearia*. The *Aplodes junctolinearia*, Græf, is evidently near to *Hudsonaria*, but Hulst says it is an *Anaplodes*, in which case it will readily be separated by its lack of the hair pencil on the hind tibiæ of the males.

(To be continued.)

NEW SPECIES OF COLORADO APHIDIDÆ, WITH NOTES UPON THEIR LIFE-HABITS.

BY C. P. GILLETTE, FORT COLLINS, COLORADO.

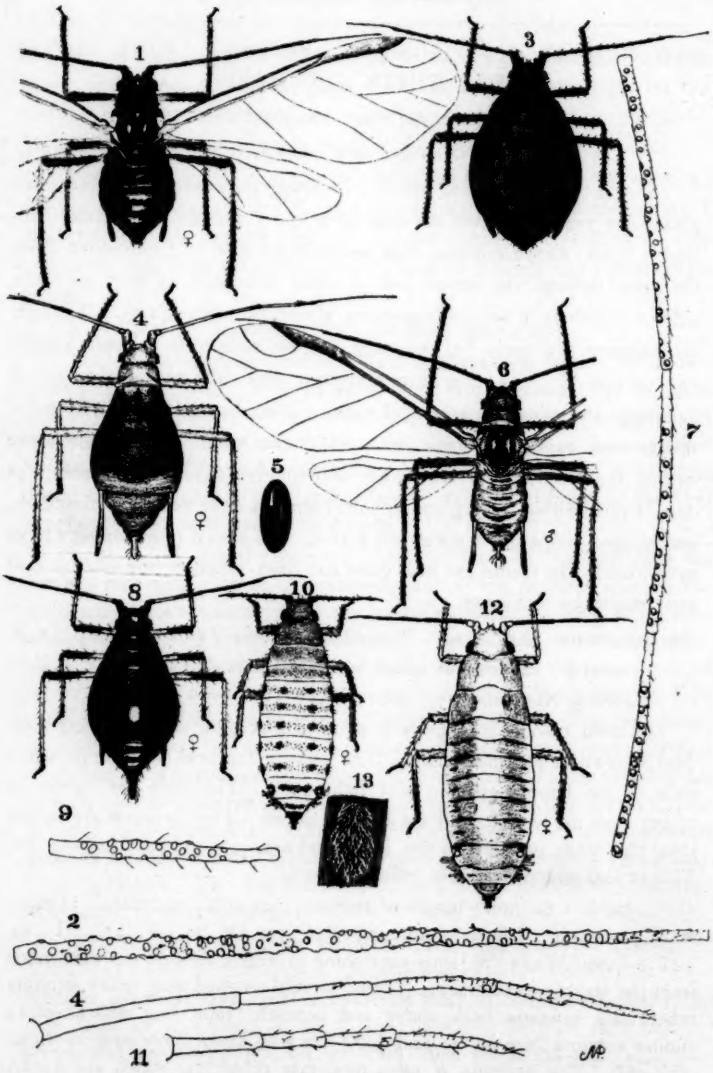
(Continued from page 20.)

During October, 1906, Mr. L. C. Bragg discovered upon the lawn grass (*Poa pratensis*) upon the campus of the Colorado Agricultural College, a black *Rhopalosiphum* that seems to be new. It continued upon the grass through the winter, and in warm situations, as upon the south side of buildings, it became extremely abundant in the spring. Through the summer and early fall the louse was not noticed or specially sought for, but this fall (1907) it is again abundant, especially next to the walls of buildings and along the border of walks. It accumulates chiefly upon the tender new leaves and upon the bases of the leaves. About my house during the early part of November and first ten days of December, the date of this writing, young and apterous females have been very abundant, and winged viviparous females not scarce. No sexual forms or eggs have been found. In places the blue grass has been killed during late fall and early winter by this louse.

Rhopalosiphum poæ, n. sp.—Winged Viviparous Female. Plate 3, figs. 1 and 3. Specimens taken on lawn grass *Poa pratensis*, at Fort Collins, November 17, 1907.

General colour, apparently a uniform black, but really a very dark dusky-brown or brownish-black. The base of the beak and the proximal ends of the femora are the only light parts. The tibiæ are lighter in colour than the femora, and are a dusky brown. The cornicles are lighter than the other portions of the body, and are light to dark dusky-brown. Thorax and abdomen highly polished above.

Length 1.80 mm.; length of antenna, 2.40 mm.; cornicles, .33 mm.; wing, 3.40 mm. Joints of antenna: III .70, IV .51, V .37, VI .14, VII .65 mm. While the joints vary some in length, they do not vary much from the above measurements. Third joint of antenna with many strongly tuberculate sensoria both above and beneath; joint four with about 24 similar sensoria (see fig. 2), and joint five with about three near its proximal end. The antenna is upon moderate tubercles, which are hardly



NEW SPECIES OF COLORADO APHIDIDAE.

noticeable on the outer margins, but are moderately produced on the inner margins, where they are somewhat swollen, as in *Myzus*. The first joint of the antenna is slightly gibbous, also reminding one of the genus *Myzus*. Wing venation normal, stigma dusky-brown, stigmal nerve strongly curved, the middle ocellus rather prominent, the lateral tubercles of the prothorax were slender or wanting, and the cauda very small, almost obsolete. The cornicles are shaped like an Indian club, with the greatest diameter a little beyond the middle and with the enlargement somewhat greater upon the inner side of the cornicles. The greatest diameter is more than twice the diameter at the proximal end. Beak short, barely attaining the second coxæ.

Apterous Viviparous Female.—(Plate 3, fig. 2.) Taken along with the alate form.

Length of body and of antenna, 1.9 mm. Joints of antenna: III .46, IV .34, V .29, VI .13, VII .50 mm. Length of cornicles, .29 mm.; shape of cornicles as in the winged form. The cauda is very short and pointed, black in colour, and does not exceed the tarsi in length. The colours are as in the alate form, except that the body is not highly polished, and the femora are not as black. Antennal tubercles rather large and strongly gibbous on the inner sides, as are the first joints of the antennæ. Except for the cornicles, the head characters of this insect would cause it to be classified as a *Myzus*. The body has many capitate hairs, which are most abundant about the head, the terminal segments of the abdomen, the legs and the proximal joints of the antennæ. The vertex is strongly produced, almost tuberculate between the antennæ.

No other food-plant than blue grass has been found for this species.

Rhopalosiphum nervatum, n. sp.—Described from specimens taken on wild rose leaves and tender stems, in Fort Collins, July 3, 1907. A light-green louse of medium size and with conspicuous black nervures in the wings, common upon wild and cultivated roses throughout the summer and fall.

Alate Viviparous Female.—Pale green in colour, with light yellowish-brown mesothoracic lobes above, dark red eyes, wings with heavy dark-brown venation, antennæ black, except joints 1 and 2 and proximal end of 3rd; tarsi and distal ends of tibiæ black, tibiæ and distal portions of

femora and distal half of cornicles dusky, cauda pale green and .22 mm. long.

Length of body, 2.10 mm.; antenna, 2.90 mm. Joints of antenna about as follows: III .60, IV .43, V .40, VI .15, VII .90 mm. Cornicles, .66 mm., and distinctly but not strongly clavate. Wing, 3 mm. long, venation normal, each nervure terminating in a small dusky spot on wing margin. Stigma long and narrow, stigmatic vein very convex.

A very abundant species on tender terminal twigs of wild and cultivated roses about Fort Collins now. Many viviparous females getting wings.

Apterous Viviparous Female.—Differs from preceding by having the body light green throughout, antenna with 7th joint black, and the others light green annulated with black at joints and no sensoria on 3rd joint; distal portion of tibiæ, femora and cornicles hardly dusky, if at all. Taken along with the alate form above.

Apterous Oviparous Female.—(Plate 3, figs. 4 and 5). On rose bushes, Fort Collins, Oct. 17, 1907.

Adult oviparous females are light orange-red in colour upon head, anterior portion of thorax and terminal portion of the abdomen, including the cauda. The eyes are very dark red. The metathorax and all the abdomen to the region of the cornicles is light to very dark dusky green. Usually a broad pale yellow or yellowish-green area crosses the abdomen in the region of the cornicles, this light colour sometimes extending to the tip of the abdomen. In some specimens the entire body is pink in colour, the dark markings being fairly uniform. The antenna is pale in proximal half with distal ends of joints 3, 4 and 5, and all of joints 6 and 7 black; legs dusky yellow with tarsi and distal ends of tibiæ black or blackish; cornicles also dusky yellow with extreme tips black, gently curved and moderately clavate.

Length of body, 2 mm.; antenna, 2.5 mm. Joints: III .60, IV .40, V .43, VI .15, VII .80 mm. Cornicles, .68 mm.; cauda, .25 mm.; antennæ upon strong tubercles, prothoracic tubercles wanting, 2nd joint of antenna gibbous upon inner side.

A few light yellow viviparous females still on the leaves, but most of the lice are oviparous females and winged males now. A few eggs,

bright green in colour, were seen upon the leaves, which became deep shining black later (fig. 5).

Winged Male.—(Plate 3, figs. 6 and 7.)

Colour, a pale greenish-yellow; head, prothorax, lobes of mesothorax above and below and three lateral spots upon the abdomen, yellowish brown; antennæ, cornicles, tibiæ, tarsi and distal ends of femora dusky to blackish; eyes dark red; in some specimens the dorsum of the abdomen shows transverse yellowish-brown lines upon many of the segments.

Length, about 1.40 mm.; antenna, 2.90 mm. Joints: III .60, IV .51, V .48, VI .16, VII 1 mm. Joints 3, 4 and 5 all have a row of very small and slightly tuberculate sensoria upon the under side for their entire lengths (fig. 7). Cornicles a little curved, distinctly clavate, and .55 mm. long; venation of wing conspicuously black. Frontal tubercles for antennæ short but fairly stout; 1st joints of antennæ gibbous upon inner side; cauda concolorous with body or a little dusky.

On account of the somewhat incrassate cornicles I am placing this species in the genus *Rhopalosiphum*, but it has the general appearance of *Macrosiphum*. This was by far the most common rose louse about Fort Collins the past summer. Described from examples taken with the oviparous females above.

Macrosiphum Sanborni,* n. sp.

A brownish-black pyriform louse, with all parts of the body above highly polished. From chrysanthemums in greenhouse.

Apterous Viviparous Female.—(Plate 3, figs. 8 and 9.)

Colour, to the naked eye, very dark brown or black. The lightest portions are the margins of the meso- and metathorax, and the posterior and posterio-lateral portions of the abdomen. The cauda, the cornicles, the distal ends of the femora, the proximal and distal ends of the tibiæ, joints 1 and 2 and distal half of antenna, black; greater portion of tibiæ, basal portions of femora and 3rd joint of antenna, brownish yellow; eyes very dark red.

Length of body, 1.85 mm.; antenna, 1.85 mm. Joints: III .53, IV .27, V .26, VI .12, VII .50 mm. Cauda, .26, and cornicles, .24 mm.

*Koch's black chrysanthemum louse, *Aphis chrysanthemi*, can hardly be this species, as it was described and figured as having the cauda very short, hardly longer than broad. *Macrosiphum campanulæ* (Kalt) seems to be the most closely-allied form so near as I can determine from the literature that I have access to.

long. The cauda is very long and stout for the size of the louse; the cornicles are stout, strongly tapering towards tip and without distinct flange; 3rd joint of antenna with about 15 to 20 circular sensoria, varying much in size; joint 4 without sensoria; a few stout hairs on joints 1 to 5; frontal tubercles rather prominent, converging towards the head, but widely separated. Thorax without lateral tubercles, or with very small ones.

The nymphs are dark amber in general colour.

Alate Viviparous Female.—Taken from chrysanthemums at Fort Collins, December 12, 1907.

General colour black, shining, with more or less of brown amber colour on posterior margins of the abdomen and in the region of the cornicles; coxæ and distal ends of femora and tibiæ very black; proximal ends of femora and tibiæ of a light amber colour.

Length of body, 1.43 mm.; antenna, 2 mm.; wings, 2.90 mm; cornicles, .20, and cauda, .23 mm. Joints of antenna: III .60, IV .26, V .30, VI .13, VII .54 mm. Joint 3 is strongly tuberculate, with a large number of sensoria. Joint 4 has about ten sensoria similar to those of joint 3; joint 5 has a single sensorium at distal end; joints set with numerous rather strong hairs.

For a fuller description of the alate female see paper on *Kansas Aphididæ*, in Vol. III, No. 1, Kansas University Science Bulletin, by C. E. Sanborn.

Prof. Sanborn, supposing he had before him Oestlund's *Nectarophora chrysanthemi* (quite a different species), described the alate female of this common chrysanthemum louse.

It is possible that this louse is the one called by Williams *Siphonophora chrysanthemicolens* in his *Host-plant List of North American Aphididæ*, Special Bulletin I., Department of Entomology, University of Nebraska, 1891, but without one word of description. In all probability it is what Mr. Gahon has referred to in Bulletin 119 of the Maryland Exp. Sta., p. 14, as the "Black Aphis of the Chrysanthemum," but also without description. I believe it entirely wrong to accept a name proposed as *chrysanthemicolens* was. If there is any group of insects more than another that need a very careful characterization to establish the identity of the species, it seems to me that it must be the Aphididæ.

We have found this louse common in greenhouses in Colorado, and upon chrysanthemums only. We have seen no sexual forms.

Nectarophora chrysanthemi, Oest, was taken upon a composite, *Bidens chrysanthemoides*, one of the Bur-Marigolds, and not upon chrysanthemum.

Brachycolus Ballii, n. sp.

A long, slender, flat, thrip-like louse with very short legs, antennæ and beak, and without cornicles; body more or less pulverulent throughout. On *Carex* sp.

Wingless Viviparous Female.—(Plate 3, figs 10 and 11.)

General colour very light greenish-yellow, mottled heavily with dusky spots above and below, and covered with white bloom. Body very long and narrow; medium length, about 2.25 mm.; width, .75 to .80 mm.; antenna, .80 mm. Joints: III .19; IV .13; V .14; VI .14; VII .09 mm. The cornicles are mere circular openings midway upon the 6th segment, and often difficult to find; cauda knobbed, short; supragenital or anal plate bifid; vertex evenly rounded and quite convex; eyes very dark red and entirely without tubercles; legs short and stout, the third pair hardly attaining the 7th abdominal segment; beak extremely short, not attaining 2nd pair of coxæ.

The dusky colour is usually solid upon head, pro- and mesothorax, and about 3 or 4 of the terminal segments of the abdomen above, and there is a large dusky spot on either lateral margin of each segment. Legs and antenna dusky to blackish; hairs upon legs, antenna and body short and fine but fairly abundant.

Described from many specimens taken at Fort Collins, Aug. 9, Oct. 30 and Dec 3. I have also taken specimens at Rocky Ford, Colo. All our specimens have been taken from *Carex Nebraskensis*.

Apterous Oviparous Female.—(Plate 3, figs. 12, 13 and 14.)

Length of body, 2.90 mm.; greatest width, .96 mm.; length of antenna, 1.37 mm. Joints: III .43, IV .26; V .25, VI .17, VII .15 mm. Legs very short; anterior tibiæ, .60 mm. long. Eyes without tubercles. General colour a pale greenish-yellow, with slight dusky transverse lines, more or less broken or indistinct at each suture of thorax and abdomen. Eyes black or very dark red; antenna black beyond 2nd joint, but more or less covered with a white pulverulence; tarsi and posterior tibiæ and a

slight longitudinal line either side of the pronotum, dusky to blackish. No other dark markings. Cornicles absent, but in the place of each is a pore with a yellow spot just before it. Between the antennæ the vertex has a large flat bilobed tubercle or prominence. At the sides of joints 6 and 7 of the abdomen there are, on the ventral surface, upon either side, glands that secrete delicate silvery white wax threads which are used to cover the newly-laid eggs (fig. 13). Cauda knobbed as in *Callipterus;* anal plate bilobed; beak very short, not reaching 2nd coxæ.

Eggs.—(Plate 3, fig. 13.)

The eggs when freshly deposited are a beautiful pale yellowish green, lightly covered with bits of slender wax threads from the abdomen of the female. Dimensions of eggs, .71 by .29 mm. They are deposited upon the free surface of the leaves or in the fold along the mid-vein and near the base.

Described from a louse and her eggs that have been under observation for two weeks in the laboratory (12–4–'07).

This louse differs from the characters that Buckton lays down for *Brachycolus* by having the 7th joint of the antenna short, and by having the cauda knobbed as in *Callipterus.*

No alate form or pupæ have been seen.

It gives me pleasure to dedicate this interesting species, the first of this genus described in America, to Dr. E. D. Ball, who first discovered it in 1899 upon the grounds of the Colorado Agricultural College.

EXPLANATION OF PLATE 3.

Plate.—*Rhopalosiphum poæ*, n. sp.: 1, alate viviparous female; 2, joints 3 and 4 of the antenna of same; 3, apterous viviparous female. *Rhopalosiphum nervatum*, n. sp.: 4, apterous oviparous female; 5, egg of same; 6, alate male; 7, joints 3 and 4 of antenna of same. *Macrosiphum Sanborni*, n. sp.: 8, apterous viviparous female; 9, joint 3 of antenna of same. *Brachycolus Ballii*, n. sp.: 10, apterous viviparous female; 11, antenna of same; 12, apterous oviparous female; 13, egg, and 14, antenna of same. All the lice are enlarged 15 diameters. Original. M. A. Palmer, Artist.

THE ENTOMOLOGICAL SOCIETY OF AMERICA.

The third meeting of the Entomological Society of America was held at the University of Chicago, December 30 and 31, 1907, in affiliation with the American Association for the Advancement of Science, and other societies. About one hundred were in attendance, coming from as widely remote localities as Maine and California, Ottawa and Louisiana.

During Monday's sessions twenty-one interesting papers on a variety of Entomological subjects were read. An exhibit of specimens and materials was open to inspection, contributions having been made by eight members.

In the evening the annual address was given by Professor Herbert Osborn, of the Ohio State University, his subject being "The Habits of Insects as a Factor in Classification." The address was followed by a most enjoyable smoker, at which the members of the Society and their friends were the guests of the Entomological section of the Chicago Academy of Sciences.

At the annual business meeting on Tuesday, the 31st, the following officers were elected:

President, Dr. William Morton Wheeler.

1st Vice-President, Dr. John B. Smith.

2nd Vice-President, Rev. Prof. C. J. S. Bethune.

Secretary-Treasurer, J. Chester Bradley.

Additional members of the Executive Committee: Dr. James G. Needham, Prof. V. S. Kellogg, Prof. Herbert Osborn, Prof. J. H. Comstock, Dr. P. P. Calvert, Mr. F. M. Webster.

STANDING COMMITTEE ON NOMENCLATURE.

Dr. H. T. Fernald, to serve 3 years.

Prof. T. D. A. Cockerell, to serve two years.

Dr. E. P. Felt, to serve one year.

COMMITTEE ON NOMENCLATURE..

Dr. Fernald moved, seconded by Dr. Smith,

1. That the Entomological Society of America hereby endorses the Code of Nomenclature adopted by the International Zoological Congress as the code which should be used by the members of the Society so far as it can be applied.

2. That cases not covered by this code which may be presented to the Society for consideration, be referred to a standing Committee on

Nomenclature, to consist of three members, one member of which shall be elected each year for a term of three years, and the opinion of this Committee on cases referred to them shall be reported to the Society at the first annual meeting subsequent to their reference to the Committee.

Mr. Bradley moved to amend by striking out the second clause, because entomology should not be treated as distinct from zoology in general, and because the Commission on Nomenclature established by the International Congress of Zoology is the sufficient and proper body before which to bring such question for decision.

Dr. Fernald stated that the reports of the Commission on Nomenclature of the International Congress of Zoology are greatly delayed by the fact that the Congress meets only once in three years, and by the rule that a question must be presented at least a year before the meeting at which it is to be considered. It was not the intention of the mover that the Committee should act in opposition to or independently from the Commission on Nomenclature, but that it should be instrumental in voicing the needs of entomology before that body, which should be the final court of reference.

With that explanation, the amendment was withdrawn and motion passed.

Publication of a Journal.

Perhaps the most important act of the meeting was embodied in the following resolutions adopted by the Executive Committee and confirmed by the Society:

1. That the Society undertake a publication to be called "Annals of the Entomological Society of America," to be issued in quarterly fascicles.

2. That it include only papers of importance or marked merit, and that each be issued and bound separately as well as in fascicles, so that each paper may be sold separately.

3. That proceedings of the meetings be included either at the beginning or end of each volume, and form one separate, which is to be sent to all members of the Society.

4. That a subscription price of $1.00 in addition to the membership fee be charged members for the annals, and that the subscription price to non-members, libraries, etc., be $3.00.

5. That an Editorial Board be selected by the Executive Committee, and that this Board shall select one of its members as managing editor, who, with his associates, shall be responsible for the selection of material to be published.

6. That if possible some one living in a suitable location, and who can undertake the work of managing editor for a series of years, be selected for this position.

7. That details not covered in this report are to be determined by the Editorial Board.

8. That actual publication under the provisions of this report be inaugurated as soon as possible.

It will be seen from the above that all members will receive the number containing the full proceedings of the meetings free, and upon payment of $1.00 the entire annals, while the regular subscription price to non-members will be $3.00.

A resolution was passed limiting the number of Fellows for the present to 10% of the membership.

The meeting then adjourned, to meet next December in Baltimore.

During the sessions the Executive Committee elected the following Fellows: Justus Watson Folsom, William Joseph Holland, Clarence Preston Gillette, Lawrence Bruner, Mark Vernon Slingerland, Henry Clinton Fall, Charles Lester Marlatt. Twenty new members were also elected. J. C. BRADLEY, Secretary-Treasurer.

SYNCHLOE LANCEOLATA, BOISDUVAL, WITH A DESCRIPTION OF A RELATED SPECIES FROM SOUTHERN CALIFORNIA.

BY FORDYCE GRINNELL, JR., PASADENA, CALIF.

The purpose of this paper is to give a description of an interesting species of Synchlöe related to *lanceolata*, Boisduval.

Synchloe lanceolata was described in 1852, and again in the second paper in 1869, in the classical and historically interesting paper, "Lépidoptères de la Californie." The type locality was given as "Montagnes de la Juba," and that of Dr. Behr's *Edwardsii*, described subsequently, as "Downieville, Sierra county"; while my specimens are from Plumas county, to the northward, but in the same faunal area, and so are really typical.

Synchloe lanceolata (Boisduval), Dyar.

♂. Upper side white. Primaries with a comparatively large, black lunule at end of cell, with the concave side turned towards the apex of the wing. Apices more or less shaded with brown scales, especially along the nervules. Hind wings white. Under side, wood-brown, with faint traces

of ochre yellow along veins and in the apices. Discal spot more curved than above. On the hind wings the colour is more dense towards the costa. A large white, slightly tapering streak, directed inwardly. Expanse, 40 mm.

♀. Similar to the male, but larger.

Synchloe australis, new species.

♂. Upper side: Primaries, white; apex rather densely shaded with blackish-brown, especially along the veins, gradually thinning out towards the inner margin. The discal spot is simply a blackish-brown dash, oblique. Hind wings white, the markings of the under side giving it a diluted appearance. Under side: Primaries white, the apices suffused with lavender-gray, lightly marked with the prevailing colour of the secondaries, and also along the costa to the base. Discal spot larger and slightly crescent-shaped. Secondaries varying from drab to olive or hair-brown, mottled in dashes and streaks, densest along veins and towards base and costa. The white dash is comparatively small. Antennæ annulated; club dark brown, tip yellowish. Thorax and base of wings, blackish-brown.

Expanse, 50 mm.

♀. Similar to the male.

Types, 1 ♂ and 2 ♀ ♀, in the collection of the author. Five topotypes in the collection of V. L. Clémence.

Types locality: Arroyo Seco Cañon and Millard Cañon, Pacific slope of the St. Gabriel Mountains, Los Angeles county, California. Elevation 2,500 feet. April 6, 1899, and April 8, 1907.

I have thirteen typical specimens of *lanceolata* from Plumas county, Calif., July, 1902, before me.

These two species differ so decidedly in practically all points that they can hardly be confused by anyone; the density of the apical shading, the shape of the discal spot, the exact colouring of the under side of the secondaries particularly, and the white dash, are all distinctive and easily-observed characters. The colour of the under side of the secondaries has heretofore been very vaguely indicated, but here they are very important, so I have consulted Ridgway's "Nomenclature of Colours" for the correct ones.

Students of butterflies have sadly neglected the comparative study of the species to the minutest details, and their relation to the evolution of the physiography of the region; before we can gain any knowledge of the evolution, origin and distribution of the butterflies, the study of physiography must be taken up along with the butterfly structure.

Synchloe australis and *lanceolata* are Transition Zone species; *lanceolata* belongs to the Sierra Nevadan faunal area, while *australis* belongs to the Southern Sierran. The relation of these forms to the evolution of the physiography of the country will be undertaken at some future time.

Mr. E. K. Harvey, of Los Angeles, has four specimens of *australis* in his collection captured in Eaton Cañon in the San Gabriel Mountains, on the following dates: March 16 and 21, 1901, and April 21, 1899. Three males and one female. Mr. Harvey has noticed the striking differences between these and specimens of typical *lanceolata* which he possesses from Siskiyou county and Placer county.

W. G. Wright, in his "Butterflies of the West Coast," refers to this species as the southern form of *lanceolata*; he does not refer to the distinctive characters of the under side, only saying that the apices are a little darker. He figures only the upper side, his specimens being from "City Creek, Cal.," near San Bernardino. The localities in Mr. Wright's book are very vague and indefinite, his descriptions likewise, all of which lessen the value of the book.

In conclusion, I will give in synoptical form the characters of these two species, to help in their readier discrimination:

1. Discal spot crescent shaped; apical shading comparatively obscure; under side of secondaries wood brown and ochre yellow; white dash large..... *lanceolata*, Bdv.
2. Discal spot straight; apical shading very intense; under side of secondaries drab or hair-brown; white dash comparatively small..... *australis*, n. sp.

ON SOME APPARENTLY NEW CECIDOMYIIDÆ.

BY WILLIAM BEUTENMULLER, AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK.

Cecidomyia (?) collinsoniæ, sp. nov.—*Larva.*—White, broad and rounded. Anal segment somewhat truncate, with the sides rounded. Breast-bone or anchor process very broad at the apex, and with two widely-separated lateral, short projections, the part between them even. Basal portion of breast-bone not visible. Length, 2 mm.; width, .75 mm.

Gall.—Green, onion-shaped, pubescent, succulent, thick-walled, with a narrow larval chamber inside containing a single larva. Length, 4–7 mm.; width, 3.50–5 mm.

Collected at Garrison, New York, by T. D. A. Cockerell and myself, in August, 1907. The gall occurs singly or in numbers on the under sides of the leaves of horse-balm *(Collinsonia Canadensis)*.

Cecidomyia (?) collinsonifolia, sp. nov.—*Larva.*—White, elongate, narrow. Anal segment rounded. Breast-bone long, narrow, gradually broadening toward the apex, where there are two rather sharp teeth, with the space between very deep. Length, 1.75 mm.; width, .50 mm.

Gall.—Pale green, elongate, narrow swellings on the mid-rib, or larger veins on the under side of the leaf of horse-balm *(Collinsonia Canadensis)*.

Collected at Garrison, New York, by T. D. A. Cockerell and myself, in August. The gall contains a single larva.

Cecidomyia (?) triadenii, sp. nov.—*Larva.*—Pale orange, long and narrow, much longer than broad, and of almost equal width. Anal segment rounded. Breast-bone or anchor process prominent, long, anterior portion greatly enlarged, with a projection on each side and two lateral teeth at the apex. Length, 4 mm.; width, .75 mm.

Gall.—Green, globular or somewhat elongate swellings on the stalk of marsh St. John's wort *(Triadenum virginicum)*. Length, 6–10 mm.; width, 5–5.50 mm.

Collected in Middlesex County, New Jersey, Sept. 15, 1907, by W. de W. Miller.

Cecidomyia (?) angelicæ, sp. nov.—*Larva.*—Orange, elongate, sides parallel. Each segment with a minute filament on each side, and a number at the terminal end of the anal segment, which is rounded. Breast-bone or anchor process long, slender and parallel to the broad anterior portion, which has a long, sharp projection on each side and three apical teeth, the median one being shorter. Length, 3.50 mm; width, .75 mm.

Gall.—Elongate swellings of the stalk of the pubescent angelica *(Angelica villosa)*. Each gall contains numerous larvæ, which are in a large chamber filled with pith of the plant. Sometimes as many as four swellings are on a single stalk. Length, 25 to 55 mm.; width, 8 to 14 mm. The larvæ hibernate in the gall.

Collected in Middlesex County, New Jersey, Oct. 22, 1907, by W. de W. Miller.

Cecidomyia (?) boehmeriæ, sp. nov.—*Larva.*—Pale yellowish-white, elongate, segments of almost equal width. Anal segment rounded and without filaments. Breast-bone or anchor process very long and slender,

gradually widening towards the anterior portion, which has two lateral teeth and a shorter median one. Length, 2 mm.; width, .50 mm.

Gall.—An elongate, fusiform swelling of the stalk of false nettle *(Boehmeria cylindrica)*. Inside is an elongate, narrow chamber, inhabited by a single larva. Length, 12 mm.; width, 6 mm.

Collected at Shushank, New York, Sept. 30, 1907, by Frank Dobbins, and at Fort Lee, New Jersey, by the writer.

Cecidomyia (?) fulva, sp. nov.—*Larva.*—Orange. Breast-bone or anchor process very long, slightly increasing in width toward the apex, which has two rather long, sharp lateral teeth. Length, 1.25 mm.; width, .75 mm.

Gall.—Green, succulent, globular or irregularly rounded swelling on the stem, petiole or leaf of the jewel-weed or balsam *(Impatiens fulva)*. Inside is a rather large chamber inhabited by a single larva. Length, 7 mm.; width, 4 mm.

Collected at Shushank, New York, Sept. 30, 1907, by Frank Dobbins, and at Fort Lee, New Jersey, by the writer.

Lasioptera lycopi Felt—*Larva.*—Pale orange, long and slender, with the segments of almost equal width. Breast-bone or anchor process long, anterior portion much swollen, with two long lateral teeth rounded at the tip. Length, 1.33 mm.; width, .25 mm.

Gall.—Rounded or globular, green, swellings on the stalks of bugle-weed *(Lycopus virginicus)*. Inside is an elongated chamber containing a single larva. Length, 10 mm.; width, 4 mm.

Collected at White Plains, N. Y., Sept. 31, 1907.

BOOK NOTICE.

MOSQUITO LIFE. By Evelyn Groesbeeck Mitchell, A. B., M. S.; G. P. Putnam's Sons, New York and London. The Knickerbocker Press, 1907.

This neat little volume of 280 pages has been published by Miss Mitchell as a graceful tribute to the memory of the late Dr. J. W. Dupree, under whom she worked, and whose notes she acquired. The volume is really a review of the same ground covered by Dr. L. O. Howard's "Mosquitoes," brought up more nearly to the level of present knowledge, and illustrated by original drawings made by the author. It may take the place of a second edition of that work, which has never been published, although so much needed. Miss Mitchell's original keys for the

determinations of species will, no doubt, prove convenient to field workers and physicians, as she has largely avoided the use of microscopical structures. In the title the species of the United States are said to be treated of, but in reality, only those of the Atlantic Coast region are dealt with. The book has not been revised to date, the most recent contributions to the knowledge of the subject being unnoticed; but for this we can scarcely blame the author, as the subject proceeds at such a rapid pace that any book must lag behind to some extent.

We regret to notice a lamentable lack of credit to Dr. Howard and his assistants. The book reads like a second edition of Dr. Howard's work. Mr. Coquillett's classification has been absolutely adhered to; the descriptions of larvæ sound so familiar that the reviewer involuntarily turned to the title page to see if they were not his own, while the illustrations show the effects of the influence of Mr. F. Knab's expert artistic criticism. Probably Miss Mitchell herself scarcely realizes how much information she has absorbed from the Government Bureaus. We should like her to try and imagine what her book would have been like if she had written it before she came to Washington. Of Dr. Howard's assistants, Mr. Coquillett only receives some, though inadequate, recognition. His name might have better assisted in gracing the title page. A certain obtuseness of scientific conscience is, we think, responsible for this condition, and it has further led our author to publish her work independently, although she was employed to assist in the preparation of the much-delayed Carnegie Institution Monograph, and had in her hands for study the material collected for that work. An attempt has been made to avoid responsibility for this action by re-examining those species that could be found in the collections of the New Jersey and New York State entomologists, and we have no doubt that all the figures were carefully redrawn out of office hours. A more candid course on Miss Mitchell's part would not have detracted from the credit due her, though it might possibly have prevented the publication of the book. Her action in copyrighting drawings which she had been paid to prepare for the Carnegie Institution Monograph, is certainly indefensible. Following the example set by the objects of her study, Miss Mitchell has played the part of a feminine Psorophora among the scientific Ædids of Washington. The Ædids themselves can do no less than commend the work, however much they may deprecate its manner of production. Our readers will find it a useful handbook. HARRISON G. DYAR.

Mailed February 6th, 1908.